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TITLE 49--TRANSPORTATION

CHAPTER V--NATIONAL HIGHWAY TRAFFIC  
SAFETY ADMINISTRATION, DEPARTMENT  
OF TRANSPORTATION

PART 571\_FEDERAL MOTOR VEHICLE SAFETY STANDARDS--Table of Contents

Subpart B\_Federal Motor Vehicle Safety Standards

Sec. 571.139 Standard No. 139; New pneumatic radial tires for light vehicles.

S1. Scope and purpose. This standard specifies tire dimensions, test requirements, labeling requirements, and defines tire load ratings.

S2. Application. This standard applies to new pneumatic radial tires for use on motor vehicles (other than motorcycles and low speed vehicles) that have a gross vehicle weight rating (GVWR) of 10,000 pounds or less and that were manufactured after 1975. This standard does not apply to special tires (ST) for trailers in highway service, tires for use on farm implements (FI) in agricultural service with intermittent highway use, and tires with rim diameters of 8 inches and below.

S3. Definitions.

Intended outboard sidewall means:

(1) The sidewall that contains a whitewall, bears white lettering or bears manufacturer, brand, and/or model name molding that is higher or deeper than the same molding on the other sidewall of the tire, or

(2) The outward facing sidewall of an asymmetrical tire that has a particular side that must always face outward when mounted on a vehicle.

S4. Tire and rim matching information.

S4.1. Each manufacturer of tires must ensure that a listing of the rims that may be used with each tire that it produces is provided to the public in accordance with S4.1.1 and S4.1.2.

S4.1.1 Each rim listing for a tire must include dimensional specifications and a diagram of the rim and must be in one of the following forms:

(a) Listed by manufacturer name or brand name in a document furnished to dealers of the manufacturer's tires, to any person upon request, and in duplicate to: Docket Section, National Highway Traffic Safety Administration, 400 Seventh Street, SW., Washington, DC 20590; or

(b) Contained in publications, current at the date of manufacture of the tire or any later date, of at least one of the following organizations:

- (1) The Tire and Rim Association.
- (2) The European Tyre and Rim Technical Organization.
- (3) Japan Automobile Tire Manufacturers' Association, Inc.
- (4) Tyre & Rim Association of Australia.
- (5) Associacao Latino Americana de Pneus e Aros (Brazil).
- (6) South African Bureau of Standards.

S4.1.2 A listing compiled in accordance with paragraph (a) of S4.1.1 need not include dimensional specifications or a diagram of a rim whose

dimensional specifications and diagram are contained in a listing published in accordance with paragraph (b) of S4.1.1.

S4.2. Information contained in a publication specified in S4.1.1(b) that lists general categories of tires and rims by size designation, type of construction, and/or intended use, is considered to be manufacturer's information required by S4.1 for the listed tires, unless the publication itself or specific information provided according to S4.1(a) indicates otherwise.

S5. General requirements. [Reserved]

S5.5 Tire Markings. Except as specified in paragraphs (a) through (h) of S5.5, each tire must be marked on each sidewall with the information specified in S5.5 (a) through (d) and on one sidewall with the information specified in S5.5 (e) through (h) according to the phase-in schedule specified in S7 of this

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standard. The markings must be placed between the maximum section width and the bead on at least one sidewall, unless the maximum section width of the tire is located in an area that is not more than one-fourth of the distance from the bead to the shoulder of the tire. If the maximum section width falls within that area, those markings must appear between the bead and a point one-half the distance from the bead to the shoulder of the tire, on at least one sidewall. The markings must be in letters and numerals not less than 0.078 inches high and raised above or sunk below the tire surface not less than 0.015 inch.

(a) The symbol DOT, which constitutes a certification that the tire conforms to applicable Federal motor vehicle safety standards;

(b) The tire size designation as listed in the documents and publications specified in S4.1.1 of this standard;

(c) The maximum permissible inflation pressure, subject to the limitations of S5.5.4 through S5.5.6 of this standard;

(d) The maximum load rating;

(e) The generic name of each cord material used in the plies (both sidewall and tread area) of the tire;

(f) The actual number of plies in the sidewall, and the actual number of plies in the tread area, if different;

(g) The term "tubeless" or "tube type," as applicable; and

(h) The word "radial," if the tire is a radial ply tire.

S5.5.1 Tire identification number.

(a) Tires manufactured before September 1, 2009. Each tire must be labeled with the tire identification number required by 49 CFR part 574 on a sidewall of the tire. Except for retreaded tires, either the tire identification number or a partial tire identification number, containing all characters in the tire identification number, except for the date code and, at the discretion of the manufacturer, any optional code, must be labeled on the other sidewall of the tire.

(b) Tires manufactured on or after September 1, 2009. Each tire must be labeled with the tire identification number required by 49 CFR part 574 on the intended outboard sidewall of the tire. Except for retreaded tires, either the tire identification number or a partial tire identification number, containing all characters in the tire identification number, except for the date code and, at the discretion of the manufacturer, any optional code, must be labeled on the other sidewall of the tire. Except for retreaded tires, if a tire does not have an intended outboard sidewall, the tire must be labeled with the tire identification number required by 49 CFR part 574 on one sidewall and with either the tire identification number or a partial tire identification number, containing all characters in the tire identification number except for the date code and, at the discretion of

the manufacturer, any optional code, on the other sidewall.

S5.5.2 [Reserved]

S5.5.3 Each tire must be labeled with the name of the manufacturer, or brand name and number assigned to the manufacturer in the manner specified in 49 CFR part 574.

S5.5.4 For passenger car tires, if the maximum inflation pressure of a tire is 240, 280, 290, 300, 330, 340, 350 or 390 kPa, then:

(a) Each marking of that inflation pressure pursuant to S5.5(c) must be followed in parenthesis by the equivalent psi, rounded to the next higher whole number; and

(b) Each marking of the tire's maximum load rating pursuant to S5.5(d) in kilograms must be followed in parenthesis by the equivalent load rating in pounds, rounded to the nearest whole number.

S5.5.5 If the maximum inflation pressure of a tire is 420 kPa (60 psi), the tire must have permanently molded into or onto both sidewalls, in letters and numerals not less than  $\frac{1}{2}$  inch high, the words "Inflate to 60 psi" or "Inflate to 420 kPa (60 psi)." On both sidewalls, the words must be positioned in an area between the tire shoulder and the bead of the tire. However, the words must be also positioned on the tire so that they are not obstructed by the flange of any rim designated for use with that tire in this standard or in Standard No. 110 (Sec. 571.110 of this part).

S5.5.6 For LT tires, the maximum permissible inflation pressure shown must be the inflation pressure that corresponds to the maximum load of the

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tire for the tire size as specified in one of the publications described in S4.1.1.(b) of Sec. 571.139. At the manufacturer's option, the shown inflation pressure may be as much as 10 psi (69 kPa) greater than the inflation pressure corresponding to the specified maximum load.

S6. Test procedures, conditions and performance requirements.

[Reserved]

S7. Phase-in schedule for tire markings.

S7.1 Tires manufactured on or after September 1, 2005 and before September 1, 2006. For tires manufactured on or after September 1, 2005 and before September 1, 2006, the number of tires complying with S4, S5.5, S5.5.1, S5.5.2, S5.5.3, S5.5.4, S5.5.5, and S5.5.6 of this standard must be equal to not less than 40% of the manufacturer's production during that period.

S7.2 Tires manufactured on or after September 1, 2006 and before September 1, 2007. For tires manufactured on or after September 1, 2006 and before September 1, 2007, the number of tires complying with S4, S5.5, S5.5.1, S5.5.2, S5.5.3, S5.5.4, S5.5.5, and S5.5.6 of this standard must be equal to not less than 70% of the manufacturer's production during that period.

S7.3 Tires manufactured on or after September 1, 2007. Each tire must comply with S4, S5.5, S5.5.1, S5.5.2, S5.5.3, S5.5.4, S5.5.5, and S5.5.6 of this standard.

[67 FR 69627, Nov. 18, 2002, as amended at 69 FR 31319, June 3, 2004]

Effective Date Note: At 68 FR 38150, June 26, 2003, Sec. 571.139 was amended by revising S3 and S5, adding S5.1 through S5.4, adding the text of S6, and adding S6.1 through S6.6, effective June 1, 2007. For the convenience of the user, the revised and added text is set forth as follows:

Sec. 571.139 Standard No. 139; New pneumatic radial tires for light

vehicles.

\* \* \* \* \*

### S3. Definitions

Bead means the part of the tire that is made of steel wires, wrapped or reinforced by ply cords and that is shaped to fit the rim.

Bead separation means a breakdown of the bond between components in the bead.

Bias ply tire means a pneumatic tire in which the ply cords that extend to the beads are laid at alternate angles substantially less than 90 degrees to the centerline of the tread.

Carcass means the tire structure, except tread and sidewall rubber which, when inflated, bears the load.

Chunking means the breaking away of pieces of the tread or sidewall.

Cord means the strands forming the plies in the tire.

Cord separation means the parting of cords from adjacent rubber compounds.

Cracking means any parting within the tread, sidewall, or inner liner of the tire extending to cord material.

CT means a pneumatic tire with an inverted flange tire and rim system in which the rim is designed with rim flanges pointed radially inward and the tire is designed to fit on the underside of the rim in a manner that encloses the rim flanges inside the air cavity of the tire.

Extra load tire means a tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Groove means the space between two adjacent tread ribs.

Innerliner means the layer(s) forming the inside surface of a tubeless tire that contains the inflating medium within the tire.

Innerliner separation means the parting of the innerliner from cord material in the carcass.

Light truck (LT) tire means a tire designated by its manufacturer as primarily intended for use on lightweight trucks or multipurpose passenger vehicles.

Load rating means the maximum load that a tire is rated to carry for a given inflation pressure.

Maximum load rating means the load rating for a tire at the maximum permissible inflation pressure for that tire.

Maximum permissible inflation pressure means the maximum cold inflation pressure to which a tire may be inflated.

Measuring rim means the rim on which a tire is fitted for physical dimension requirements.

Open splice means any parting at any junction of tread, sidewall, or innerliner that extends to cord material.

Outer diameter means the overall diameter of an inflated new tire.

Overall width means the linear distance between the exteriors of the sidewalls of an inflated tire, including elevations due to labeling, decorations, or protective bands or ribs.

Ply means a layer of rubber-coated parallel cords.

Ply separation means a parting of rubber compound between adjacent plies.

Pneumatic tire means a mechanical device made of rubber, chemicals, fabric and steel or other materials, that, when mounted on an automotive wheel, provides the traction and contains the gas or fluid that sustains the load.

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Radial ply tire means a pneumatic tire in which the ply cords that extend to the beads are laid at substantially 90 degrees to the

centerline of the tread.

Reinforced tire means a tire designed to operate at higher loads and at higher inflation pressures than the corresponding standard tire.

Rim means a metal support for a tire or a tire and tube assembly upon which the tire beads are seated.

Section width means the linear distance between the exteriors of the sidewalls of an inflated tire, excluding elevations due to labeling, decoration, or protective bands.

Sidewall means that portion of a tire between the tread and bead.

Sidewall separation means the parting of the rubber compound from the cord material in the sidewall.

Test rim means the rim on which a tire is fitted for testing, and may be any rim listed as appropriate for use with that tire.

Tread means that portion of a tire that comes into contact with the road.

Tread rib means a tread section running circumferentially around a tire.

Tread separation means pulling away of the tread from the tire carcass.

Treadwear indicators (TWI) means the projections within the principal grooves designed to give a visual indication of the degrees of wear of the tread.

Wheel-holding fixture means the fixture used to hold the wheel and tire assembly securely during testing.

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#### S5. General requirements

S5.1. Size and construction. Each tire shall fit each rim specified for its size designation in accordance with S4.1.

S5.2. Performance requirements. Each tire shall conform to each of the following:

(a) It shall meet the requirements specified in S6 for its tire size designation, type, and maximum permissible inflation pressure.

(b) It shall meet each of the applicable requirements set forth in paragraphs (c) and (d) of this S5.2, when mounted on a model rim assembly corresponding to any rim designated by the tire manufacturer for use with the tire in accordance with S4.

(c) Except in the case of a CT tire, its maximum permissible inflation pressure shall be 240, 280, 300, 340, or 350 kPa. For a CT tire, the maximum permissible inflation pressure shall be 290, 330, 350, or 390 kPa.

(d) Its load rating shall be that specified either in a submission made by an individual manufacturer, pursuant to S4, or in one of the publications described in S4 for its size designation, type and each appropriate inflation pressure. If the maximum load rating for a particular tire size is shown in more than one of the publications described in S4, each tire of that size designation shall have a maximum load rating that is not less than the published maximum load rating, or if there are differing maximum load ratings for the same tire size designation, not less than the lowest published maximum load rating.

S5.3. Test sample. For the tests specified in S6, use:

(a) One tire for high speed;

(b) Another tire for endurance and low inflation pressure performance; and

(c) A third tire for physical dimensions, resistance to bead unseating, and strength, in sequence.

S5.4. Treadwear indicators. Except in the case of tires with a 12-inch or smaller rim diameter, each tire shall have not less than six

treadwear indicators spaced approximately equally around the circumference of the tire that enable a person inspecting the tire to determine visually whether the tire has worn to a tread depth of one sixteenth of an inch. Tires with 12-inch or smaller rim diameter shall have not less than three such treadwear indicators.

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S6. Test procedures, conditions and performance requirements. Each tire shall meet all of the applicable requirements of this section when tested according to the conditions and procedures set forth in S5 and S6.1 through S6.7.

#### S6.1. Tire dimensions

S6.1.1 Test conditions and procedures.

S6.1.1.1 Tire Preparation.

S6.1.1.1.1 Mount the tire on the measuring rim specified by the tire manufacturer or in one of the publications listed in S4.1.1

S6.1.1.1.2 In the case of a P-metric tire, inflate it to the pressure specified in the following table:

Inflation pressure (kPa)		T-type	CT Tires (kPa)	
		temporary use		
		spare		
		inflation		
Standard	Reinforced	pressure (kPa)	Standard	Reinforced
180	220	420	230	270

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S6.1.1.1.3 In the case of a LT tire, inflate it to the pressure at maximum load as labeled on sidewall.

S6.1.1.1.4 Condition the assembly at an ambient room temperature of 38 [deg]C for not less than 24 hours.

S6.1.1.1.5 Readjust the tire pressure to that specified in S6.1.1.2.

S6.1.1.2 Test Procedure.

S6.1.1.2.1 Measure the section width and overall width by caliper at six points approximately equally spaced around the circumference of the tire, avoiding measurement of the additional thickness of the special protective ribs or bands. The average of the measurements so obtained are taken as the section width and overall width, respectively.

S6.1.1.2.2 Determine the outer diameter by measuring the maximum circumference of the tire and dividing the figure so obtained by Pi (3.14).

S6.1.2 Performance Requirements. The actual section width and overall width for each tire measured in accordance with S6.1.1.2, shall not exceed the section width specified in a submission made by an individual manufacturer, pursuant to S4.1.1(a) or in one of the publications described in S4.1.1(b) for its size designation and type by more than:

(a) (For tires with a maximum permissible inflation pressure of 32, 36, or 40 psi) 7 percent, or

(b) (For tires with a maximum permissible inflation pressure of 240, 280, 290, 300, 330, 350 or 390 kPa, or 60 psi) 7 percent or 10 mm (0.4

inches), whichever is larger.

### S6.2 High Speed Performance

#### S6.2.1 Test conditions and procedures.

##### S6.2.1.1 Preparation of tire.

S6.2.1.1.1 Mount the tire on a test rim and inflate it to the pressure specified for the tire in the following table:

Tire application	Test pressure (kPa)
P-metric:	
Standard load.....	220
Extra load.....	260
Load Range C.....	320
Load Range D.....	410
Load Range E.....	500
CT:	
Standard load.....	270
Extra load.....	310

S6.2.1.1.2 Condition the assembly at 38 [deg]C for not less than three hours.

S6.2.1.1.3 Before or after mounting the assembly on a test axle, readjust the tire pressure to that specified in S6.2.1.1.1.

##### S6.2.1.2 Test procedure.

S6.2.1.2.1 Press the assembly against the outer face of a test drum with a diameter of 1.70 m <plus-minus<ls-thn-eq> 1%.

S6.2.1.2.2 Apply to the test axle a load equal to 85% of the tire's maximum load carrying capacity.

S6.2.1.2.3 Break-in the tire by running it for 2 hours at 80 km/h.

S6.2.1.2.4 Allow tire to cool to 38 [deg]C and readjust inflation pressure to applicable pressure in 6.2.1.1.1 immediately before the test.

S6.2.1.2.5 Throughout the test, the inflation pressure is not corrected and the test load is maintained at the value applied in S6.2.1.2.2.

S6.2.1.2.6 During the test, the ambient temperature, measured at a distance of not less than 150 mm and not more than 1 m from the tire, shall be maintained at not less than 38 [deg]C.

S6.2.1.2.7 The test is conducted, continuously and uninterrupted, for ninety minutes through three thirty-minute consecutive test stages at the following speeds: 140, 150, and 160 km/h.

S6.2.1.2.8 Allow the tire to cool for one hour. Measure its inflation pressure. Then, deflate the tire, remove it from the test rim, and inspect it for the conditions specified in S6.2.2(a).

S6.2.2 Performance requirements. When the tire is tested in accordance with S6.2.1:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, belt or bead separation, chunking, open splices, cracking, or broken cords.

(b) The tire pressure, when measured at least 1 hour after the end of the test, shall not be less than the initial pressure specified in S6.2.1.

### S6.3 Tire Endurance

## S6.3.1 Test conditions and procedures.

## S6.3.1.1 Preparation of Tire.

S6.3.1.1.1 Mount the tire on a test rim and inflate it to the pressure specified for the tire in the following table:

Tire application	Test Pressure (kPa)
P-metric:	
Standard load.....	180
Extra load.....	220
LT:	
Load Range C.....	260
Load Range D.....	340
Load Range E.....	410
CT:	
Standard load.....	230
Extra load.....	270

S6.3.1.1.2 Condition the assembly at 38 [deg]C for not less than three hours.

S6.3.1.1.3 Readjust the pressure to the value specified in

S6.3.1.1.1 immediately before testing.

S6.3.1.2 Test Procedure.

S6.3.1.2.1 Mount the assembly on a test axle and press it against the outer face of a

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smooth wheel having a diameter of 1.70 m <plus-minus<ls-thn-eq> 1%.

S6.3.1.2.2 During the test, the ambient temperature, measured at a distance of not less than 150 mm and not more than 1 m from the tire, shall not be less than 38 [deg]C.

S6.3.1.2.3 Conduct the test, without interruptions, at not less than 120 km/h test speed with loads and test periods not less than those shown in the following table:

Test period	Duration (hours)	Load as a percentage of tire maximum load rating
1	4	85%
2	6	90
3	24	100

S6.3.1.2.4 Throughout the test, the inflation pressure is not corrected and the test loads are maintained at the value corresponding to each test period, as shown in the table in S6.3.1.2.3.

S6.3.1.2.5 Allow the tire to cool for one hour after running the tire for the time specified in the table in S6.3.1.2.3, measure its inflation pressure. Inspect the tire externally on the test rim for the conditions specified in S6.3.2(a).

S6.3.2 Performance requirements. When the tire is tested in accordance with S6.3.1:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, belt or bead separation, chunking, open splices, cracking or broken cords.



(b) The tire pressure, when measured at least one hour after the end of the test, shall not be less than the initial pressure specified in S6.3.1.

#### S6.4 Low Inflation Pressure Performance

S6.4.1 Test conditions and procedures.

S6.4.1.1 Preparation of tire.

S6.4.1.1.1 This test is conducted following completion of the tire endurance test using the same tire and rim assembly tested in accordance with S6.3 with the tire deflated to the following appropriate pressure:

Tire application	Test pressure (kPa)
P-metric:	
Standard load.....	140
Extra load.....	160
LT:	
Load Range C.....	200
Load Range D.....	260
Load Range E.....	320
CT:	
Standard load.....	170
Extra load.....	180

S6.4.1.1.2 The assembly is conditioned at not less than 38 [deg]C.

S6.4.1.1.3 Before or after mounting the assembly on a test axle, readjust the tire pressure to that specified in S6.4.1.1.1.

S6.4.1.2 Test procedure.

S6.4.1.2.1 The test is conducted for ninety minutes at the end of the test specified in S6.3, continuous and uninterrupted, at a speed of 120 km/h (75 mph).

S6.4.1.2.2 Press the assembly against the outer face of a test drum with a diameter of 1.70 m + 1%.

S6.4.1.2.3 Apply to the test axle a load equal to 100% of the tire's maximum load carrying capacity.

S6.4.1.2.4 Throughout the test, the inflation pressure is not corrected and the test load is maintained at the initial level.

S6.4.1.2.5 During the test, the ambient temperature, at a distance of not less than 150 mm and not more than 1 m from the tire, is maintained at not less than 38 [deg]C.

S6.4.1.2.6 Allow the tire to cool for one hour. Measure its inflation pressure. Then, deflate the tire, remove it from the test rim, and inspect it for the conditions specified in S6.4.2(a).

S6.4.2 Performance requirements. When the tire is tested in accordance with S6.4.1:

(a) There shall be no visual evidence of tread, sidewall, ply, cord, innerliner, belt or bead separation, chunking, open splices, cracking, or broken cords, and

(b) The tire pressure, when measured at least one hour after the end of the test, shall not be less than the initial pressure specified in S6.4.1.

S6.5 Tire strength.

S6.5.1 Tire strength for P-metric tires. Each tire shall comply with the requirements of S5.3 of Sec. 571.109.

S6.5.2 Tire strength for LT tires. Each tire shall comply with the requirements of S7.3 of Sec. 571.119.